



GoddardView

Volume 9 Issue 8
July 2013



NASA Launches Satellite to Study Sun's Atmosphere

Pg 3

Goddard to Get First Green Roof

Pg 6

Goddard Employees Ham it Up

Pg 9

THE WEEKLY



Employee Engagement Activities

Explore Goddard via engagement activities July 16–18. See JWST, MMS and DSCOVR in the Spacecraft Test and Integration Facility. Discover amazing science displays in the Building 28 Atrium. Cheer on your colleagues in “Name that Org.” See astronaut Tom Marshburn. To learn more, click on the picture.

Intern Open Mic 2

Gain new perspectives and get energized by the exciting work interns are doing at Goddard this summer. Join us Thursday, July 25 from 1-3:00 p.m. in the Building 8 Auditorium. For more information or questions, contact [Shamara Thornton](#).

INTERN OPEN MIC!



Building 8
Auditorium
July 25 2013
1-3:00 p.m.

In a world where innovation rules,
one group of interns will gather to
change the way we think forever.
Gain a new perspective and get
energized by the exciting work.



GROVER Passes Greenland Test

Defying 30 mph gusts and temperatures of minus 22 F, NASA's new polar rover recently demonstrated in Greenland that it could operate completely autonomously in one of Earth's harshest environments. GROVER was designed by teams of students attending engineering boot camps at Goddard. Click on the image to learn more.

Hubble Finds a True Blue Planet

Astronomers making visible-light observations with NASA's Hubble Space Telescope have deduced the actual color of a planet orbiting another star 63 light-years away. The planet is HD 189733b, one of the closest exoplanets that can be seen crossing the face of its star. See more by clicking on the image.



Goddard View

The Weekly – 2

NASA Launches Satellite to Study

Sun's Atmosphere – 3

GPM Spreads Its Wings in Solar Array

Deployment Test – 4

New Flights Project Building Features a

“Green” Roof – 6

NASA is Spinning a Webb – 8

Goddard Employees Ham it Up – 9

NASA Administrator Bolden

Vists Goddard – 10

Outside Goddard

Chris Morris – 12

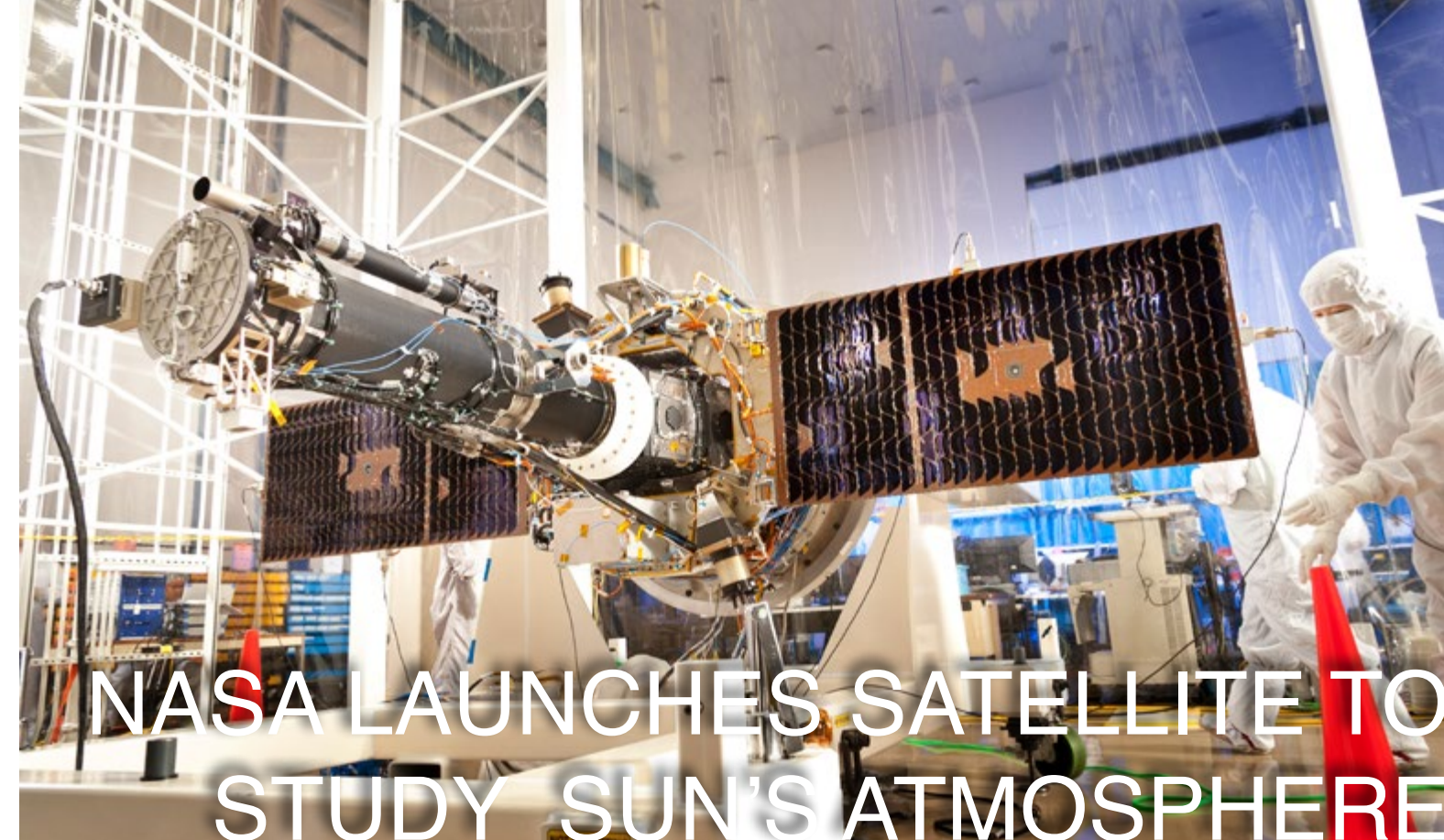
On the cover: The Pegasus rocket ignites to send NASA's IRIS spacecraft into orbit. Photo credit: NASA TV

GoddardView

Goddard View is an official publication of NASA's Goddard Space Flight Center. *Goddard View* showcases people and achievements in the Goddard community that support Goddard's mission to explore, discover, and understand our dynamic universe. [Goddard View](#) is published weekly by the Office of Communications.

News items for publication in *Goddard View* must be received by noon Wednesday of each week. You may submit contributions to the editor via e-mail at john.m.putman@nasa.gov. Ideas for new stories are welcome but will be published as space allows. All submissions are subject to editing.

CONTENTS



NASA LAUNCHES SATELLITE TO STUDY SUN'S ATMOSPHERE

By: Steve Cole, Susan M. Hendrix, Rachel Hoover, George H. Diller

NASA's Interface Region Imaging Spectrograph spacecraft launched June 26 at 10:27 p.m. EDT from Vandenberg Air Force Base, Calif. The mission to study the solar atmosphere was placed in orbit by an Orbital Sciences Corporation Pegasus XL rocket.

“We are thrilled to add [IRIS](#) to the suite of NASA missions studying the sun,” said John Grunsfeld, NASA's associate administrator for science. “IRIS will help scientists understand the mysterious and energetic interface between the surface and corona of the sun.”

IRIS will observe how solar material moves, gathers energy and heats up as it travels through a little-understood region in the sun's lower atmosphere. This interface region between the sun's photosphere and corona powers its dynamic million-degree atmosphere and drives the solar wind. The interface region is where most of the sun's ultraviolet emission is generated. These emissions impact the near-Earth space environment and Earth's climate.

The Pegasus XL carrying IRIS was deployed from an Orbital L-1011 carrier aircraft over the Pacific Ocean at an altitude of 39,000 feet, about 100 miles northwest of Vandenberg. The rocket placed IRIS into a sun-synchronous polar orbit that will allow it to make almost continuous solar observations during its two-year mission.

The L-1011 took off from Vandenberg at 6:30 p.m. PDT and flew to the drop point over the Pacific Ocean, where the aircraft released the Pegasus XL from beneath its belly. The first stage ignited five seconds later to carry IRIS into space. IRIS successfully separated from the third stage of the Pegasus rocket at 7:40 p.m. At 8:05 p.m., the IRIS team confirmed the spacecraft had successfully deployed its solar arrays, has power and has acquired the sun, indications that all systems are operating as expected.

“Congratulations to the entire team on the successful development and deployment of the IRIS mission,” said IRIS project manager Gary Kushner of the Lockheed Martin Solar and Atmospheric Laboratory in Palo Alto, Calif. “Now that IRIS is in orbit, we can begin our 30-day engineering checkout followed by a 30-day science checkout and calibration period.”

IRIS is expected to start science observations upon completion of its 60-day commissioning phase. During this phase the team will check image quality and perform calibrations and other tests to ensure a successful mission.

NASA's Explorer Program at Goddard Space Flight Center in Greenbelt, Md., provides overall management of the IRIS mission. The principal investigator institution is Lockheed Martin Space Systems Advanced Technology Center. NASA's Ames Research Center will perform ground commanding and flight operations and receive science data and spacecraft telemetry.

The Smithsonian Astrophysical Observatory designed the IRIS telescope. The Norwegian Space Centre and NASA's Near Earth Network provide the ground stations using antennas at Svalbard, Norway; Fairbanks, Alaska; McMurdo, Antarctica; and Wallops Island, Va. NASA's Launch Services Program at the agency's Kennedy Space Center in Florida is responsible for the launch service procurement, including managing the launch and countdown. Orbital Sciences Corporation provided the L-1011 aircraft and Pegasus XL launch system. ■

Above: The fully integrated spacecraft and science instrument for IRIS is seen in a clean room at the Lockheed Martin Space Systems Sunnyvale, Calif. facility. The solar arrays are deployed in the configuration they will assume when in orbit. Photo credit: NASA/Lockheed Martin



“A loud hiss filled the room as engineers turned on air hoses.”

GPM SPREADS ITS WINGS IN SOLAR ARRAY DEPLOYMENT TEST

By: Kasha Patel

NASA successfully completed two pre-vibration solar array deployment tests of the Global Precipitation Measurement satellite on June 6 and June 15, 2013.

“Cross your fingers. Cross your toes,” said Art Azarbarzin, GPM project manager, as he watched engineers take their places around the [GPM](#) Core satellite, set up on its end in the middle of the clean room.

A loud hiss filled the room as engineers turned on air hoses. The hoses pumped air through tubes attached to the solar panels’ supports and out of hockey puck-shaped coasters. Azarbarzin explained that the support system and air cushion is designed to reduce friction and best mimic how the solar array would float in space.

Next, a man’s voice from the adjacent control room started to count down. Five seconds later, five loud pops sounded one after the other. The pops resulted from the triggering of Frangibolts, which discharge in small, controlled explosions to release the solar array. After the loud pops sounded, the four panels of the array started to slowly unfold like an accordion, until the wing fully extended across the floor.

The solar array panels and boom, a large support beam running across the back of the first two solar panels, locked into place. Engineers inspected the solar array front and back, closely examining the panels’ junctions and wires. After confirming the array was successfully deployed, they manually unlocked and folded the solar array back into the body of the spacecraft.

The GPM Core will orbit Earth at an angle that enables the satellite to observe the globe from the Antarctic Circle to the Arctic Circle. Its orbit will also cross the paths of other satellites that will contribute data to the GPM mission’s global precipitation data set.

To increase the satellite’s exposure to the sun, the GPM Core has two solar wings. Each wing has four panels, and each panel has between 800 and 1,200 solar cells. Together, the two

wings provide a total of 2,000 watts. The arrays convert solar energy to electricity, which help power spacecraft electronics and the satellite’s two instruments: the GPM Microwave Imager and the Dual-frequency Precipitation Radar. Excess power charges the satellite’s battery, which is used when the GPM Core isn’t in direct sunlight.

The solar array wing deployments are part of the GPM Core satellite’s series of environmental tests. The thermal vacuum test that simulates temperature changes in the vacuum of space was completed in early February and the electromagnetic interference test that assures all elements of the satellite work together was performed in May. The Core satellite will also undergo the vibration and acoustic test, which simulate rocket vibration during launch, and shock and separation test, which simulates shock to the satellite when being separated from the rocket. A final solar array deployment test will be conducted following the completion of the environmental test program to assure that the solar arrays will survive the launch environment and deploy successfully.

The GPM Core, the largest satellite built and tested at Goddard, is scheduled to launch in February 2014 from Japan. The GPM Mission is a collaboration between NASA and the Japan Aerospace Exploration Agency. Measuring rain and snow worldwide every three hours. GPM data will advance understanding of Earth’s water and energy cycles, enhance the forecasting of extreme events that cause natural disasters, and improve researchers’ ability to use satellite precipitation information to directly benefit society. ■

Opposite: A solar array wing begins to release from the GPM Core satellite in a deployment test on Thursday, June 6, 2013. Photo credit: NASA/Goddard/Debbie McCallum

Above: Full deployment of one of the GPM Core satellite’s solar arrays during test in June. The array measures 18.8 feet long and 9.2 feet wide, and it consists of four solar panels. Click on the image to watch a video of the test. Photo credit: NASA Goddard/Debbie McCallum





NEW FLIGHTS PROJECT BUILDING FEATURES A “GREEN” ROOF

By: Cynthia M. O’Carroll

Excavation is now underway for the new Flight Projects Building, Building 36, at NASA’s Goddard Space Flight Center in Greenbelt, Md. The building was designed to bring in light and will include a “green” roof. This unique building, designed by architects and engineers at AECOM’s office in Arlington, Va., ensures that it will be much more than just another brick and mortar government building.

“Our newest building merges functional requirements with our natural and manmade environment. It is also reflective of the campus history, existing architectural characteristics, the Goddard Facilities Master Plan, and our culture,” said Rene Wong Pineiro, Project Manager with Goddard’s Facilities Management Division.

The building will be located east of Buildings 12 and 23, and nestled along the existing hillside with a suspended glass core extending out, forming a bridge that ties together the Building 34 area and lower campus. The exterior design respects the surrounding buildings and natural environment, and helps to establish an architectural palette for future NASA Goddard Projects.

The new building will be approximately 120,000 square feet, with four stories of office space and a mechanical penthouse on the roof. It will accommodate about 330 employees, mostly from the Flight Projects Directorate offices, currently located in Buildings 16 and 16W, and from the New Opportunities Offices, currently located in Buildings 8 and 86.

The building’s central core includes a series of ‘suspended’ glass volume meeting spaces, highlighted by an open monumental staircase and a second floor bridge that will allow for

unimpeded pedestrian flow throughout the building. Small group collaboration areas will be located at the core of the building on each level, and a second floor symposium room will host approximately 80 people.

On each side of the central core are the office wings that will house project management suites. The interior design includes the use of demountable partitions for private offices that will allow for ultimate flexibility and reorganization of staff as needs change. A combination of clear and translucent/frosted glazing will provide privacy while still allowing natural light into the office space. There will be conference rooms, copy and storage areas, and pantries for each suite.

The upper floor wings will incorporate glass in a rhythm of transparent, translucent and opaque panels, allowing for a maximum of natural light and surrounding views while connecting the building’s occupants to the outside. Vertical metal fins on the exterior of the building will create a mixture of different shadows and textures and are part of the energy performance strategy to reduce heat gain and prevent glare in the offices.

The exterior of the building will incorporate terracotta, glass, and a metal curtain wall, providing a palette of materials and colors to achieve a harmony and balance with the existing campus style. Terracotta panels feature the natural material quality, color, and modular nature of the adjacent brick buildings, but employ a modern curtain wall approach. The terracotta is used as a backdrop to define larger volumes from which the glass elements are suspended.

“This will be the first Goddard building to include a small “green”

roof top terrace and it will be accessed from the third floor lobby. This small deck with seating areas will provide a peaceful retreat overlooking the wooded area beyond,” said Katie Chakola, Deputy Project Manager.

The low maintenance landscaping surrounding the building will provide outdoor gathering and seating spaces at the main entrance and along the south side of the site, as well as additional seating along the east side.

The new building was designed to meet the Silver Leadership in Energy and Environmental Design certification requirements and will be the fourth LEED-certified building at Goddard. The LEED program uses a rating system checklist for the design, construction and operation of high performance green buildings. These strategies aim at increasing performance, reducing waste and improving quality of life.

The construction trailers were brought onsite in mid-April and the site was officially closed to the public at the end of the month. The work that occurred in May included installing the construction site fence, excavating the current parking lot surface, and implementing the sediment and erosion control measures

with the Maryland Department of the Environment. Site excavation for the building foundations began in June. During upcoming months, the concrete foundation will be formed and poured and the four-story steel infrastructure will be erected.

The structure is targeted for completion by the spring of 2015. ■

Above: New Flight Projects Building (36), east elevation, showing the symposium entrance and the bridge and wooded pathway that lead to Building 34.

Below: Building 36, west elevation. Image credits: AECOM





NASA is spinning a “Webb” and it is not about a spider. It’s about a part of the James Webb Space Telescope that is being spin-tested in a centrifuge to prove it can withstand the rigors of space travel.

This video, called “Spinning a Webb,” is part of an ongoing video series about the Webb telescope. The series, called “Behind the Webb,” is produced at the Space Telescope Science Institute in Baltimore, Md., and takes viewers behind the scenes with engineers as they test the Webb telescope’s components.

In the video, institute host Mary Estacion takes viewers to the giant centrifuge chamber at NASA’s Goddard Space Flight Center in Greenbelt, Md., where the telescope’s Integrated Science Instrument Module was tested in an environment to simulate the acceleration forces it will endure during launch.

The instrument module, known as ISIM, is one of three major elements that make up the Webb telescope flight system. ISIM will house Webb’s four main instruments, which will detect light from distant stars and galaxies, and planets orbiting other stars. The structure provides support for Webb’s cameras and other instruments.

Estacion interviewed Bill Chambers, centrifuge project engineer at NASA Goddard, who explains why the center has

the world’s largest centrifuge. Goddard’s 140-foot-diameter centrifuge can accelerate a 2.5-ton payload up to 30 *g*, 30 times Earth’s normal gravity, which is well beyond the force experienced during a launch. The most intense rollercoasters in the world top out at about 5 *g*, and then only for brief moments. The Webb equipment can experience between 6 *g* and 7 *g* because of vibration.

In the video, Estacion also talked with Eric Johnson, ISIM structure manager at NASA Goddard, about why the centrifuge was used and the stresses the machine will impose on the instrument module. Johnson explained that the module was tested at seven times Earth’s gravity to simulate the pull it will experience during launch, “and then when it gets to zero *g* way out in space, we have to show that it’s the same shape as it was here on Earth.”

Usually in centrifuge testing, engineers run the tests a little beyond actual environment conditions. They take the structural loading conditions that they expect to see during launch and then raise them up 25 percent. Instruments should be able to handle actual conditions if they hold up to the increased, simulated experience. Two 1,250-horsepower motors power the centrifuge, which can spin up to 156 mph, more than 30 rotations per minute.

Click on the picture above to see the video. ■

Above: The centrifuge starts its spin. Photo credit: Space Telescope Science Institute

NASA IS SPINNING A WEBB

By: Rob Gutro



Down a gravel road past some softball diamonds, a bit more than a mile from NASA’s Goddard Space Flight Center in Greenbelt, Md., 10 people crowd around a table in the corner of a field.

“Go a little higher,” Patrick Kilroy says. His friend Hugh O’Donnell hoists an antenna. “That’s as high as it goes,” O’Donnell says. Suddenly a Morse code beep cuts through the radio static. They quickly decode the signal, log the message and set up for another passing satellite’s ham radio transmission.

Kilroy and O’Donnell participate in Goddard’s 24-member Amateur Radio Club. They traveled out to that dusty field on a Wednesday afternoon to practice for the American Radio Relay League’s Field Day, a 24-hour event held June 22 and 23, where amateur radio operators, known as hams, talk to as many fellow stations as possible.

“We try to do many groups around the country and communicate with each other, making two-way quick contacts, and competing with each other,” Kilroy said. The league awards prizes to the hams who make the most contacts over a wide range of radio bands, including by voice, by satellite and even online.

Before the age of the Internet and immediate digital communications, the Goddard Amateur Radio Club’s station, call sign WA3NAN, broadcast space shuttle mission audio on six bands to listeners around the world for more than 20 years.

Ham radio has found its niche in the Internet age, Capon said. “When the Internet goes down, ham radio still works.”

Last year’s Field Day had more than 35,000 stations communicating and competing worldwide, according to the league organizing the event, but for Goddard’s ham radio club, Field Day is not about winning the contest.

“Winning is important to us, but what’s even more important to us at Goddard is learning how to use the radios in an emergency situation,” Kilroy said.

“It’s one of the few events that’s a coalescing event for all the hams at Goddard,” Capon said.

For this, the 99th Field Day, Goddard hams went back to their club trailers out in the field and allowed everyone attending, licensed or not, a chance to get on the air. “Whether you’re a communicator, experimenter, builder, software writer, all of that, there’s so many different aspects that you can find something that fits you,” Capon said. ■

Above: Members of the Amateur Radio Club at NASA’s Goddard Space Flight Center in Greenbelt, Md., test their equipment before the American Radio Relay League’s 2013 Field Day event. Photo credit: NASA/Goddard/Sawyer Rosenstein

GODDARD EMPLOYEES HAM IT UP

By: Sawyer Rosenstein

Volume 9 Issue 8 • July 2013

NASA ADMINISTRATOR BOLDEN VISITS GODDARD



NASA administrator Charlie Bolden visited Goddard and spoke at a town hall meeting with with Goddard Center Director Chris Scolese on July 10 in the Building 8 auditorium at NASA's Goddard Space Flight Center in Greenbelt, Md.

The Administrator discussed future NASA goals and the 2014 budget. Bolden also answered employee questions following his presentation.

Photo credit: NASA/Goddard/Jacob Larsen



OUTSIDE GODDARD

By: Elizabeth M. Jarrell

THE TRUEST FRIEND

Initially to help his lifelong friend with multiple sclerosis, and now to honor his memory, program specialist Chris Morris devotes his life to fundraising, including biking solo across the United States. Morris' mission began when his lifelong friend Gordon "Gordo" Jayne, a former Goddard employee, was diagnosed with MS.

Following college graduation, Morris and Jayne moved into a group house in Hyattsville, Maryland. "Those were some of the happiest days of my life," said Morris. "We were all pretty active guys doing things outdoors." The two friends used to bike the C&O Canal, riding the 184½ miles over three days. Both Morris and Jayne found jobs at Goddard, married and had children.

When Jayne was 27, he felt some numbness in his left leg, which was eventually diagnosed as MS. Jayne worked at Goddard until he was forced to retire on disability. "Even then, he was in a powered wheelchair," said Morris. "When he could no longer use the bathroom by himself, it was time to go."

"With MS, you retain mental acuity, but you're trapped in a body that won't respond to your wishes. Eventually Gordo could only move his arms, he couldn't walk and he began losing mobility in his upper body. After that, he started having difficulty breathing," said Morris.

After Jayne's diagnosis, mutual friends formed Team Lamberts Cycling to raise money for the Maryland Chapter of the National MS Society. Jayne was their captain. "Everyone knows someone with MS," said Morris. "It hits home."

Their annual fundraiser is called the National Multiple Sclerosis Society Chesapeake Challenge, which is a century (100 mile) bike ride on the Eastern Shore of Maryland. Gordo was always at the finish line until travel became impossible for him. Morris has completed 17 of these century rides. Combined, Team Lamberts Cycling members have done 101 century rides and raised almost \$500,000.

As a special MS fundraiser, Morris decided to bike solo across the country. Jayne and Morris came up with the slogan "One Penny a Mile," referencing their goal of enlisting 1,000 people to donate a penny a mile for each of the 3,000 miles to raise \$30,000. "We ended up raising over \$32,000!

It was cool! At least 60 percent of the donations came from the Goddard community," said Morris.

Morris began his cross-country journey on March 13, 2011, in San Diego, Calif., and finished 44 days later in St. Augustine, Fla. He followed a route designed for cycling called the Southern Tier, which hugs the border with Mexico, crosses Texas, follows the Gulf coast and ends in Florida. His bike carried about 70 pounds of gear including a tent, sleeping bag and water. He camped or stayed in the cheapest hotels he could find.

He rode alone and his cell phone did not always get reception. He had a SPOT receiver that showed his location every 10 minutes. People tracked him on a special website

that averaged over 1,000 hits a day. Jayne ran the website's blog using Morris' trip notes and emailed photos of Morris to those following his adventure.

For his part, Morris continued his fundraising efforts throughout the ride, leaving Team Lamberts business cards, designed by his children, in hotel rooms and restaurants across the entire southern United States. "Along the way, I met tons of people, from bikers to bums to businessmen. When you're riding a loaded bike

and riding solo, you're very approachable. People came up to me whenever I stopped," said Morris.

In June 2011, the NMSS accorded him the Champion of Hope award, which is their highest honor. "The challenge," said Morris, "is to maintain the fundraising momentum that I built during my trip and make good use of the huge database of donors we built for One Penny a Mile." He continues to do the annual Chesapeake Challenge and is planning a big fundraising trip down the Mississippi in about two years.

Gordon "Gordo" Jayne died the first week of October 2012.

"Gordo was a realist and so am I. We knew the reality was that he didn't have long. But what I also know is that I'll continue these MS fundraising efforts for the rest of my life," said Morris. Once biking partners for long hauls, now Morris bikes with Jayne only in his thoughts. ■

Center: Gordon "Gordo" Jayne (left) and Morris with the bib for top fundraiser. Photo provided by Chris Morris.

